

<b>MONSANTO Europe S.A.</b> Material Safety Data Sheet
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## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product name**

**Roundup® Max**

**Product use**

Herbicide

**Chemical name**

Not applicable

**Synonyms**

Not applicable

**Company**

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## 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Active ingredient**

Ammonium salt of N-(phosphonomethyl)glycine; {Ammonium salt of glyphosate}

**Composition**

Components	CAS No.	EINECS/ ELINCS No.	% by weight (approximate)	EU Symbols & R phrases of components
Ammonium salt of glyphosate	114370-14-8		78.5	
Surfactant(s)			21	
Sodium sulphite	7757-83-7	231-821-4	<=0.5	

## 3. HAZARDS IDENTIFICATION

**Potential health effects**

**Likely routes of exposure**

Skin contact

**Eye contact, short term**

Irreversible eye effects observed in laboratory animals.

Not expected to produce significant adverse eye effects as contact with the granule is unlikely when recommended use instructions are followed.

**Skin contact short term**

Not expected to produce significant adverse effects when recommended use instructions are followed.

**Inhalation, short term**

Not expected to produce significant adverse effects when recommended use instructions are followed.

**Medical conditions aggravated by exposure**

Hypersensitivity to sulphiting agents.

**Note**

A very small percentage of particularly sensitive people may suffer skin or respiratory reactions.

**Potential environmental effects**

Not expected to produce significant adverse effects when recommended use instructions are followed.

Refer to section 11 for toxicological and section 12 for environmental information.

#### 4. FIRST AID MEASURES

##### Eye contact

Immediately flush with plenty of water.  
Continue for at least 15 minutes.  
If easy to do, remove contact lenses.  
If there are persistent symptoms, obtain medical advice.

##### Skin contact

Take off contaminated clothing, wristwatch, jewellery.  
Wash affected skin with plenty of water.  
Wash clothes before re-use.

##### Inhalation

Remove to fresh air.

##### Ingestion

Rinse mouth thoroughly with water.  
Remove particles from mouth.  
Immediately offer water to drink.  
Do NOT induce vomiting unless directed by medical personnel.  
If symptoms occur, get medical attention.

##### Advice to doctors

This product is not an inhibitor of cholinesterase.

##### Antidote

Treatment with atropine and oximes is not indicated.

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#### 5. FIRE FIGHTING MEASURES

##### Flash point

Not applicable.

##### Extinguishing media

Recommended: Water, foam, dry chemical, carbon dioxide (CO<sub>2</sub>)

##### Unusual fire and explosion hazards

Minimise use of water to prevent environmental contamination.  
Environmental precautions: see section 6.

##### Hazardous products of combustion

Carbon monoxide (CO), phosphorus oxides (P<sub>x</sub>O<sub>y</sub>), nitrogen oxides (NO<sub>x</sub>), ammonia (NH<sub>3</sub>)

##### Fire fighting equipment

Self-contained breathing apparatus.  
Equipment should be thoroughly decontaminated after use.

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#### 6. ACCIDENTAL RELEASE MEASURES

##### Personal precautions

Use personal protection recommended in section 8.

##### Environmental precautions

SMALL QUANTITIES:  
Low environmental hazard.  
LARGE QUANTITIES:  
Minimise spread.  
Keep out of drains, sewers, ditches and water ways.

**Methods for cleaning up**

- Dig up heavily contaminated soil.
- Collect in containers for disposal.
- Refer to section 7 for types of containers.
- Flush spill area with water.
- Minimise use of water to prevent environmental contamination.

Refer to section 13 for disposal of spilled material.

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**7. HANDLING AND STORAGE**

Good industrial practice in housekeeping and personal hygiene should be followed.

**Handling**

- Avoid contact with eyes.
- When using do not eat, drink or smoke.
- Wash hands thoroughly after handling or contact.
- Thoroughly clean equipment after use.
- Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
- Emptied packages retain product residue and dust.
- Observe all labelled safeguards until container is cleaned, reconditioned or destroyed.

**Storage**

- Compatible materials for storage: stainless steel, aluminium, fibreglass, plastic, glass lining
- Incompatible materials for storage: galvanised steel, unlined mild steel, see section 10.
- Keep out of reach of children.
- Keep away from food, drink and animal feed.
- Keep only in the original container.
- Keep container off wet floors.
- Keep container dry.
- Keep container closed.
- Minimum shelf life: 2 years.

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Airborne exposure limits**

Components	Exposure Guidelines
Ammonium salt of glyphosate	No specific occupational exposure limit has been established.
Surfactant(s)	No specific occupational exposure limit has been established.
Sodium sulphite	No specific occupational exposure limit has been established.

**Engineering controls**

- Have eye wash facilities immediately available at locations where eye contact can occur.

**Eye protection**

- If there is significant potential for contact:
  - Wear dust goggles.

**Skin protection**

- If repeated or prolonged contact:
  - Wear chemical resistant gloves.

**Respiratory protection**

- No special requirement when used as recommended.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

Colour/colour range:	Tan - White
Form:	Granules (free-flowing) (dust free) (hygroscopic)
Odour:	Mild
Flash point:	Not applicable., Not classified as a flammable solid.
Particle size:	700 µm; (granule diameter)
Density:	0.70 g/cm <sup>3</sup> ; (tap density)
Solubility:	Water: Soluble
Partition coefficient (log Pow):	< 0.000 (active ingredient)

## 10. STABILITY AND REACTIVITY

### Stability

Stable under normal conditions of handling and storage.

### Hazardous decomposition

Thermal decomposition: Hazardous products of combustion: see section 5.

### Materials to avoid/Reactivity

Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

## 11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Data obtained on product, similar products and on components are summarized below.

### Acute oral toxicity

**Rat, LD50:** 2,814 mg/kg body weight

Target organs/systems: forestomach, gastro-intestinal tract, kidneys, liver, lung, spleen

Other effects: breathing difficulty, decreased activity, soft stools

### Acute dermal toxicity

**Rabbit, LD50:** > 5,000 mg/kg body weight

Target organs/systems: skin

Other effects: soft stools, decrease of food consumption

### Skin irritation

**Rabbit, 6 animals, OECD 404 test:**

Redness, mean EU score: 0.11

Swelling, mean EU score: 0.00

Days to heal: 3

### Eye irritation

**Rabbit, 6 animals, OECD 405 test:**

Conjunctival redness, mean EU score: 2.00

Conjunctival swelling, mean EU score: 2.50

Corneal opacity, mean EU score: 1.00

Iris lesions, mean EU score: 0.00

Days to heal: > 21

Other effects: tearing of iris, pannus

### Skin sensitization

**Guinea pig, Buehler test:**

Positive incidence: 0 %

**Analogous liquid formulation**

**EXPERIENCE WITH HUMAN EXPOSURE**

**Ingestion, excessive, intentional misuse:**

**Respiratory effects:** pneumonitis (aspiration)

**Gastro-intestinal effects:** nausea/vomiting, diarrhea, abdominal pain, bloody vomiting (haematemesis)

**Cardiovascular effects:** abnormal heart rhythm (cardiac dysrhythmia), decreased heart output (myocardial depression)

**General/systemic effects:** disturbances of fluid and electrolyte regulation, abnormally decreased blood volume (hypovolaemia), elevated serum amylase, fluid loss (haemoconcentration), no cholinesterase inhibition

**Laboratory effects - blood chemistry:** elevated serum transaminases, mild acidosis

**Eye contact, short term, epidemiological:**

**Note:** No cases of irreversible eye effects could be attributed to glyphosate formulations in an extensive epidemiological survey of reported accidental eye contact with these formulations.

**N-(phosphonomethyl)glycine: {glyphosate}**

**Mutagenicity**

**In vitro and in vivo mutagenicity test(s):**

Not mutagenic.

**Repeated dose toxicity**

**Rabbit, dermal, 21 days:**

NOAEL toxicity: > 5,000 mg/kg body weight/day

Target organs/systems: none

Other effects: none

**Rat, oral, 3 months:**

NOAEL toxicity: > 20,000 mg/kg diet

Target organs/systems: none

Other effects: none

**Carcinogenicity**

**Mouse, oral, 24 months:**

NOEL tumour: > 30,000 mg/kg diet

NOAEL toxicity: ~ 5,000 mg/kg diet

Tumours: none

Target organs/systems: liver

Other effects: decrease of body weight gain, histopathologic effects

**Rat, oral, 24 months:**

NOEL tumour: > 20,000 mg/kg diet

NOAEL toxicity: ~ 8,000 mg/kg diet

Tumours: none

Target organs/systems: eyes

Other effects: decrease of body weight gain, histopathologic effects

**Toxicity to reproduction/fertility**

**Rat, oral, 3 generations:**

NOAEL toxicity: > 30 mg/kg body weight

NOAEL reproduction: > 30 mg/kg body weight

Target organs/systems in parents: none

Other effects in parents: none

Target organs/systems in pups: none

Other effects in pups: none

**Developmental toxicity/teratogenicity**

**Rat, oral, 6 - 19 days of gestation:**

NOAEL toxicity: 1,000 mg/kg body weight

NOAEL development: 1,000 mg/kg body weight

Other effects in mother animal: decrease of body weight gain, decrease of survival

Developmental effects: weight loss, post-implantation loss, delayed ossification

Effects on offspring only observed with maternal toxicity.

**Rabbit, oral, 6 - 27 days of gestation:**

NOAEL toxicity: 175 mg/kg body weight  
NOAEL development: 175 mg/kg body weight  
Target organs/systems in mother animal: none  
Other effects in mother animal: decrease of survival  
Developmental effects: none

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## 12. ECOLOGICAL INFORMATION

This section is intended for use by ecotoxicologists and other environmental specialists.

Data obtained on product and components are summarized below.

### Aquatic toxicity, fish

#### **Rainbow trout (*Oncorhynchus mykiss*):**

Acute toxicity, 96 hours, static, LC50: 20 mg/L

### Aquatic toxicity, invertebrates

#### **Water flea (*Daphnia magna*):**

Acute toxicity, 48 hours, static, EC50: 42 mg/L

### Aquatic toxicity, algae/aquatic plants

#### **Green algae (*Selenastrum capricornutum*):**

Acute toxicity, 72 hours, EbC50 (biomass): 1.7 mg/L

### Avian toxicity

#### **Bobwhite quail (*Colinus virginianus*):**

Acute oral toxicity, LD50: 1,651 mg/kg body weight

### Arthropod toxicity

#### **Honey bee (*Apis mellifera*):**

Oral/contact, 48 hours, LD50: > 100 µg/bee

### Soil organism toxicity, invertebrates

#### **Earthworm (*Eisenia foetida*):**

Acute toxicity, 14 days, LC50: > 1,250 mg/kg dry soil

### Soil organism toxicity, microorganisms

#### **Nitrogen and carbon transformation test:**

12.7 kg/ha, 28 days: Less than 25% effect on nitrogen or carbon transformation processes in soil.

### N-(phosphonomethyl)glycine: {glyphosate}

### Avian toxicity

#### **Bobwhite quail (*Colinus virginianus*):**

Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet

#### **Mallard duck (*Anas platyrhynchos*):**

Dietary toxicity, 5 days, LC50: > 4,640 mg/kg diet

#### **Bobwhite quail (*Colinus virginianus*):**

Acute oral toxicity, LD50: > 3,851 mg/kg body weight

### Bioaccumulation

#### **Bluegill sunfish (*Lepomis macrochirus*):**

Whole fish: BCF: < 1

No significant bioaccumulation is expected.

### Dissipation

#### **Soil, field:**

Half life: 2 - 174 days

Koc: 884 - 60,000 L/kg

Adsorbs strongly to soil.

#### **Water, aerobic:**

Half life: < 7 days

### Surfactant

### Biodegradation

#### **Zahn-Wellens test:**

Degradation: 80 % within 28 days

Inherently biodegradable.

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### 13. DISPOSAL CONSIDERATIONS

#### Product

- Dispose of as hazardous industrial waste.
- Burn in proper incinerator.
- Recycle if appropriate facilities/equipment available.
- Keep out of drains, sewers, ditches and water ways.
- Follow all local/regional/national/international regulations.

#### Container

- Empty packaging completely.
- Ensure packaging cannot be reused.
- Recycle if appropriate facilities/equipment available.
- Burn in proper incinerator.
- Dispose of as non hazardous industrial waste.
- Follow all local/regional/national/international regulations.

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### 14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

Not regulated for transport.

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### 15. REGULATORY INFORMATION

#### EU label (manufacturer self-classification)

- Xi - Irritant
- R41 Risk of serious damage to eyes.
- S2 Keep out of reach of children.
- S13 Keep away from food, drink and animal feedingstuffs.
- S39 Wear eye/face protection.

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### 16. OTHER INFORMATION

This Safety Data Sheet has been prepared following the EU Directive 93/112.  
The information given here is not necessarily exhaustive but is representative of relevant, reliable data.  
Follow all local/regional/national/international regulations.  
Please consult supplier if further information is needed.  
In this document the British spelling was applied.  
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#### Endnotes:

- {a} EU label (manufacturer self-classification)
- {b} EU label (Annex I)
- {c} National classification

Full denomination of most frequently used acronyms. BCF (Bioconcentration Factor), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), EC50 (50% effect concentration), ED50 (50% effect dose), I.M. (intramuscular), I.P. (intraperitoneal), I.V. (intravenous), Koc (Soil adsorption coefficient), LC50 (50% lethality concentration), LD50 (50% lethality dose), LDLo (Lower limit of lethal dosage), LEL (Lower Explosion Limit), LOAEC (Lowest Observed Adverse Effect Concentration), LOAEL (Lowest Observed Adverse Effect Level), LOEC (Lowest Observed Effect Concentration), LOEL (Lowest Observed Effect Level), MEL (Maximum Exposure limit), MTD (Maximum Tolerated Dose), NOAEC (No Observed Adverse Effect Concentration), NOAEL (No Observed Adverse Effect Level), NOEC (No Observed Effect Concentration), NOEL (No Observed Effect Level), OEL (Occupational Exposure Limit), PEL (Permissible Exposure Limit), PII (Primary Irritation Index), Pow (Partition coefficient n-octanol/water), S.C. (subcutaneous), STEL (Short-Term Exposure Limit), TLV-C (Threshold Limit Value - Ceiling), TLV-TWA (Threshold Limit Value - Time Weighted Average), UEL (Upper Explosion Limit)

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